

Bioengineering human stem cell-derived beta cell organoids to monitor cell health in real time and improve therapeutic outcomes in patients

Grant Award Details

Bioengineering human stem cell-derived beta cell organoids to monitor cell health in real time and improve therapeutic outcomes in patients

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-13498

Investigator:

Name:	Katy Digovich
Institution:	Minutia, Inc.
Type:	PI

Award Value: \$1,198,550

Status: Pre-Active

Grant Application Details

Application Title: Bioengineering human stem cell-derived beta cell organoids to monitor cell health in real time and improve therapeutic outcomes in patients

Public Abstract: **Research Objective**

We will generate nanoprobe-containing stem cell-derived human beta cells that can be monitored in real time in response to inflammatory stress upon transplantation in patients with type 1 diabetes.

Impact

Our product will replace donor islets for cell replacement therapy in patients with type 1 diabetes, and will provide a readout of cell survival and an opportunity for therapeutic intervention.

Major Proposed Activities

- Test insulin-producing cell organoids with nanosensors to secrete insulin in response to elevated glucose and emit a signal in real time, and test similar activities in animal models of diabetes.
- Test the ability of insulin-producing cell organoids with nanosensors to emit a measurable signal in response to increased inflammation in vitro and after transplantation in small animal models

Statement of Benefit to California: The American Diabetes Association states that California, with the highest number of patients with diabetes in the country, also has the highest cost at \$39.47 billion. A large proportion of these patients are insulin-dependent and are potential candidates for islet replacement therapy. Developing technologies that can improve transplantation outcomes in patients directly affects long-term quality of life. All Minutia staff are CA residents, with a long history of collaboration with UCSF.

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